

Now, with this specially designed **ELECTRONICS SLIDE RULE...** and the four-lesson, self-training course that comes with it,

g Case PROGRAMMED over 500 Y FOR S PENNY (DETACH HERE) your busi- be able to CIE Elec-	Please send me the new CIE Electronics Slide Rule, complete with top-grain leather carrying case and four-lesson AUTO-PROGRAMMED instruction course. I understand that with the course, I will receive an examination which may be sent in for grading and consultation by CIE's expert instructors. When the course is completed I will also receive a some Graduation Certificate, suitable for framing. I have enclosed \$19.95 as payment in full including age. If I am not completely satisfied after using the rule and course for 10 days I may return the material a full and prompt refund. TED NELSON BX 1546 POUGHKEEPSIE N Y
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you can solve problems like these in 20 seconds—without pencil and paper

- ① What is the maximum current that a 2-watt, 4800-ohm resistor can carry without damage?
- ② What size inductor must you use with a 38 μf (pf) capacitor to build a tank circuit that will tune to 2360 kc?
- ③ What is the gain of an amplifier in decibels if the input is 0.032 watts and the output is 12 watts?
- ④ What size cathode bias resistor should you use to produce 6 volts bias if plate current is 120 ma and screen current 20 ma?

(for answers, see centerfold of enclosed booklet)

and it's yours to try without risk for 10 DAYS

**RETURN THIS VALUABLE
CERTIFICATE TODAY** →

TO RECEIVE

- ★ Your CIE Electronics Slide Rule
- ★ Top-Grain Leather Carrying Case
- ★ Complete 4-Lesson AUTO-PROGRAMMED Instruction Course with over 500 practice problems

**—ALL YOURS TO TRY FOR
10 DAYS
WITHOUT RISKING A PENNY**

TAX DEDUCTIBLE: If used in your business or profession, you may be able to deduct the entire cost of your CIE Electronics Slide Rule and Course on your Federal income tax return. See your accountant.

FOR YOUR RECORDS: Save this stub and use other side to record your check or money order number and date sent.

(DETACH HERE)



10-Day Trial Certificate

Please send me the new CIE Electronics Slide Rule, complete with top-grain leather carrying case and four-lesson AUTO-PROGRAMMED instruction course.

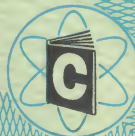
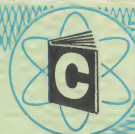
I understand that with the course, I will receive an examination which may be sent in for grading and consultation by CIE's expert instructors.

When the course is completed I will also receive a handsome Graduation Certificate, suitable for framing.

I have enclosed \$19.95 as payment in full including postage. If I am not completely satisfied after using the slide rule and course for 10 days I may return the materials for a full and prompt refund.

TED NELSON
BX 1546
POUGHKEEPSIE N Y

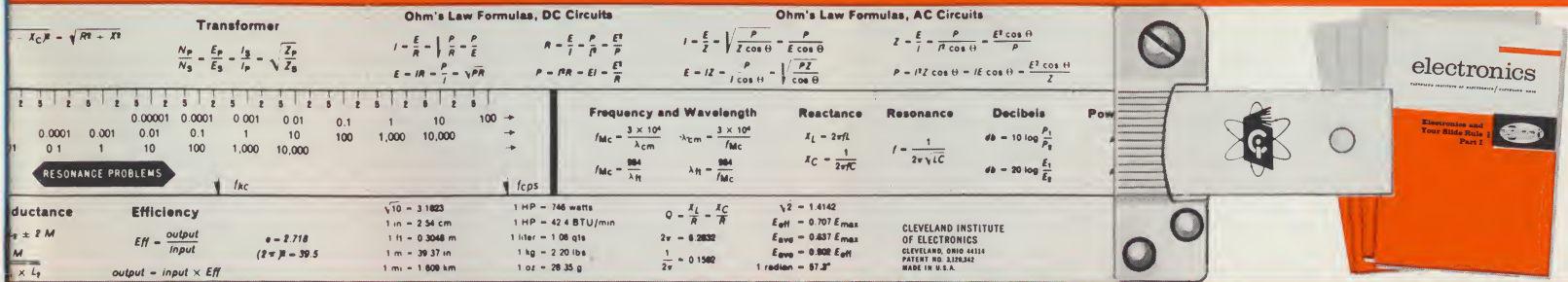
Please write your Zip Code here, if not above _____



New...Electronics Slide Rule

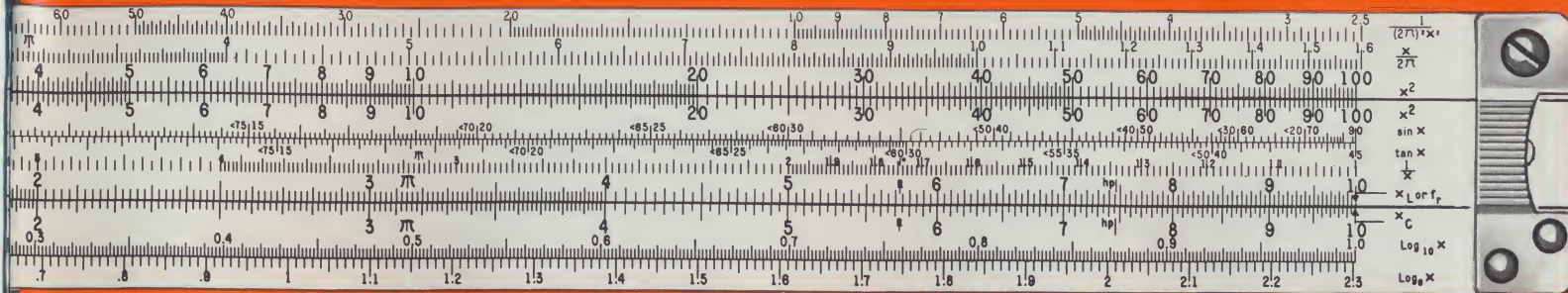
with Four-Lesson AUTO-PROGRAMMED Instruction Course!

TM



Solve Electronics Problems in Seconds!

instrument... "made to order" for men in electronics!



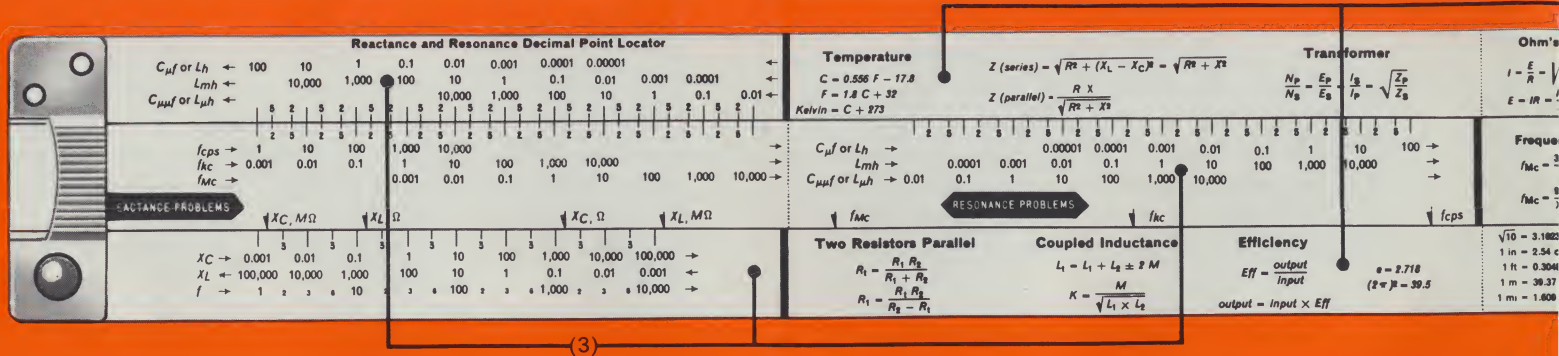
ment . . . regardless of temperature and humidity. The durable, lustrous white finish resists scratches, dirt and rough treatment. Numbers, letters and markings are sharp and clear for quick, accurate readings; all inverse scales are printed in red.

CIE's patented* rule features nine conventional scales (A,B,S,T,C,I, C,D,L and Ln), *plus* two special scales. The "H" scale (1) is used to solve resonant frequency problems. The "2 π " scale (2) is used

for inductive or capacitive reactance problems, or for any problem involving the factor 2 π . This combination of scales was selected on the basis of what men working in electronics told us they needed. It's a combination that permits you to handle all kinds of difficult electronics problems as well as such non-electronic computation as multiplication, division, square roots, logs, etc.

*U.S. Patent No. 3,120,342

On the “flip” side...a unique decimal point locator **plus** useful

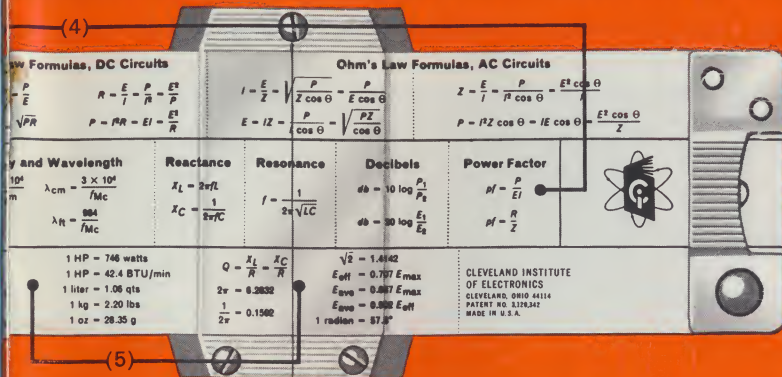


Men who have used conventional slide rules will quickly see there's something totally new on this side of the rule. It's an ingenious Reactance and Resonance Decimal Point Locator (3). You will find it particularly useful for quickly and accurately locating the decimal point in all problems involving reactance and resonance. (This scale eliminates the need to convert from one unit to another in such problems.)

The Decimal Point Locator uses a nomograph technique and has

a sliding scale and indices instead of a straightedge. The scales are calibrated for mmf, μh , mh, h, c.p.s., kc, mc, X_L and X_C in ohms and M-ohms, with graduations only at major points. Besides indicating the electrical units involved, the Decimal Point Locator also provides rough but usually adequate numerical answers. If you need greater accuracy, the values obtained may be used to correlate more precise figures with the 2π and H scales on the face of the rule. Thus, you can use the CIE Slide Rule as a simple calculator for approximate answers,

formulas and conversion factors!



or as a regular slide rule for more accurate answers.

The "flip" side of CIE's Electronics Slide Rule also contains many useful formulas (4) for Fahrenheit-Centigrade Temperature Conversion, Ohms Law, Formulas for AC and DC Circuits, Frequency and Wavelength, Reactance, Resonance, Coupled Inductance and Efficiency. In addition, it has 18 commonly-used conversion factors (5) for instant reference.

And, with every CIE Slide Rule...this handsome leather carrying case!



Here's a special bonus: The CIE Slide Rule Case is made of genuine top-grain leather that's doubly reinforced at the "wear" spots. This sturdy case has a heavy-duty plastic liner, plus a removable belt loop for convenient carrying. It's a high quality case that provides ample protection for the precision instrument it was designed to carry.

An exclusive CIE "extra"...a practical instruction

This amazing program will enable you to solve complex problems in seconds.

Now that you've seen the Electronics Slide Rule, take a look at the other half of this amazing offer. Four AUTO-PROGRAMMED lessons, complete with illustrations and examples, make learning faster, more effective, and interesting. You'll master hundreds of short-cuts . . . soon be solving complex electronics problems with speed and accuracy you never dreamed possible! Each lesson consists of small, "bite-size" segments plus examples and practice problems; there's also an examination you can send in for grading and consultation by CIE's expert instructors. And, when you complete your Instruction Course, you'll receive a handsome Graduation Certificate as evidence of your newly-acquired skill.

Part I Serves as a self-training course and handy refresher in proper slide rule procedure. Multiplication, division and interpolation are just a few of the sections covered. 14 sections with 130 practice problems.

Part II In addition to reciprocals, square roots and proportion, this lesson shows you how to use the slide rule for blending multi-step problems into one smooth operation. 10 sections with 149 practice problems.

Part III Explains use of special electronics scales, the Reactance and Resonance Decimal Point Locator, and trigonometric functions. 12 sections, 128 practice problems.

Part IV Right triangle applications plus summary of common formula settings and special 16-page appendix on the use of the Ln scale. 8 sections, 95 practice problems.



course of four **AUTO-PROGRAMMED** TM Slide Rule Lessons

while others plod along the old-fashioned "pad and pencil" way.



**Sticky
problems
like these
are a "snap"
when you use
CIE's
Electronics
Slide
Rule!**

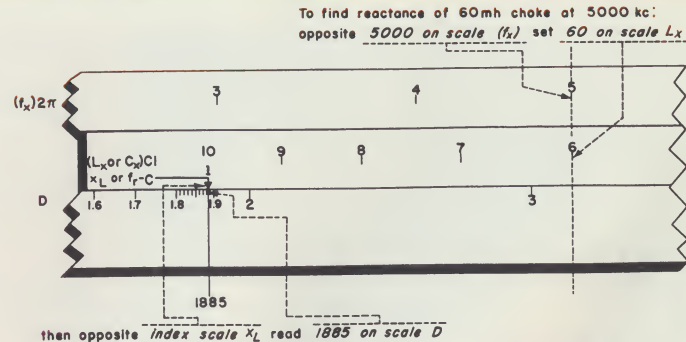
- Q.** What is the maximum current that a 2-watt, 4800 ohm resistor can carry without being damaged?
- A.** 20.4 ma (requires one slide rule setting and 15 seconds to work).
- Q.** What size inductor must I use with a $38 \mu\mu\text{f}$ (pf) capacitor to build a tank circuit that will tune to 2360 kc?
- A.** 0.12 mh (one setting, 20 seconds. Slide Rule reads answer directly in mh or μh with decimal point correctly located . . . no need to convert from one unit to another, no complicated formula to remember).
- Q.** If the input to an amplifier is 0.032 watts and the output 12 watts, what is the gain of the amplifier in decibels?
- A.** 25.7 db (one setting, 20 seconds).
- Q.** What size cathode bias resistor should I use to produce 6 volts bias if plate current is 120 ma and screen current is 20 ma?
- A.** 43 ohms (one setting, 12 seconds).

Thousands call the CIE Slide Rule "the most useful, practical"

Example No. 1: using the 2π scale to solve a reactance problem . . . Find accurately the reactance of a 60 mh choke coil at 5,000 kc. Solution . . . See illustration.

- (1) Set the Hairline over 5,000 (which is the frequency) on scale $(f_x) 2\pi$.
- (2) Move the slide so that 60 (which is the inductance) on scale $(L_x \text{ or } C_x) Cl$ is under the hairline.
- (3) Opposite the index of scale $X_L \text{ or } f_r - C$, read 1,885 (which is the inductive reactance) on scale D.
- (4) Use the Decimal Point Locator scales on the back of the rule to obtain 1.5 megohm as the approximate reactance value.

Hence, the accurate reactance of the choke is 1.885 megohms.



Finding that a 60 mh choke at a frequency of 5000 kc has a reactance of 1.885 megohms.

These two examples are taken directly from Part III of the Slide Rule Instruction Course. While they are just two of the hundreds of examples included in this course, they demonstrate how this slide rule is used . . . and how you can soon learn to use it in your everyday work.

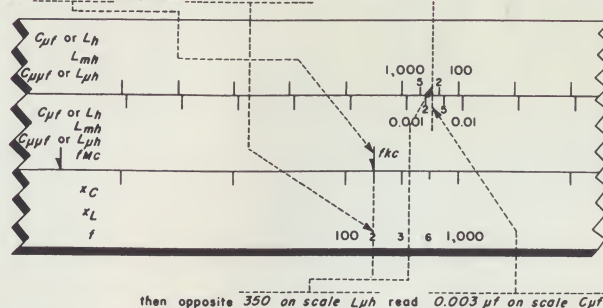
tool" they have ever used. These two examples show why!

Example No. 2: using the Decimal Point Locator to solve a resonance problem. As you may know, any reading from a slide rule is in absolute form (no decimal). Thus the figures "15" could be 0.15, 1.5, or 15,000. Where to put that decimal point is a real problem . . . even for men with years of experience! Conventional rules have no means of accurately locating decimals. But with CIE's Decimal Point Locator, it's easy to put that decimal point exactly where it belongs. Let's go through a problem to see just how this works:

Approximately what value of capacity should be used with an inductance of $350 \mu\text{h}$ in order to resonate at 200 kc? Solution . . . Refer to illustration.

- (1) Move the slide so that the slide arrow designated f-kc is opposite 200 on scale f on the lower body of the rule.
- (2) Place the hairline over 350 on scale $L_{\mu\text{h}}$ on the upper body of the rule.
- (3) Under the hairline read 0.003 on scale $C_{\mu\text{f}}$ on the slide. Hence, the answer is $0.003 \mu\text{f}$.

To find C required with $350 \mu\text{h}$ to resonate at 200 kc:
set arrow $f\text{-kc}$ opposite 200 on scale f



Showing that for $350 \mu\text{h}$ to resonate at 200 kc, a capacitance of approximately $0.003 \mu\text{f}$ is required.



Your assurance of complete satisfaction...

When CIE introduced the electronics slide rule described on the preceding pages, it came as no surprise to the thousands of men who have gained success in electronics through CIE training programs. They know that CIE has a special understanding of what's needed in electronics. As a result, the CIE Slide Rule is an instrument that's *really* useful. And the Instruction Course of AUTO-PROGRAMMED Lessons is an outstanding example of how a man, working on his own, can gain skills and knowledge he will use for a lifetime.

But CIE knows that "seeing is believing." And that's why their Slide Rule with Instruction Course is available to you on a 10-day trial basis. It's also backed by the "Satisfaction Warranty" you see on the next page. It's a "no-risk" offer if ever there was one! So take advantage. Order your CIE Slide Rule today.

Cleveland Institute of Electronics has been a leader in electronics training since 1934, and is an Accredited Member of the National Home Study Council. Over 15,500 students are currently enrolled in CIE electronics courses.

CIE backs their Electronics Slide Rule with this exclusive warranty:

SATISFACTION WARRANTY

The Electronics Slide Rule with Instruction Course is available only from Cleveland Institute of Electronics, and is covered by CIE's exclusive "Satisfaction Warranty." Order it now . . . use it for ten full days. Then, *if you're not completely satisfied*, simply return it. CIE will refund your payment in full.

EQUIPMENT REPORT

Here's what Radio-Electronics says about this great Slide Rule Course.

Slide Rule for Electronics

THERE MUST BE THOUSANDS OF PEOPLE in electronics who have never had the marvelous adventure of calculating problems with a slide rule; other thousands have had to content themselves with a slide rule not specifically designed for electronics. For both groups, the new model N-515-T rule designed and marketed by Cleveland Institute of Electronics and built for them by Pickett will open a whole new era of quick calculations.

Even if you have never had a slide rule in your hands before, the four lesson Auto-Programmed instruction course that is included takes you by the hand and leads you from simple calculations right through resonance and reactance problems with hardly a hitch. If you already use a slide rule, you'll find the lessons a first-rate refresher course. And it explains in detail the shortcuts built into this new rule.

On the front of the rule you'll find the regular slide-rule scales: A, B, C, D, CI, S, T, L and Ln; but there is also an H scale and a 2π scale as well as markings on the other scales such as X_L , X_C , f (for frequency), to make it easy to select the correct scales.

One big benefit of the new rule is the "Decimal Point Locator" (DPL) on the reverse side. Here you can find exactly where the decimal point should be, and get a rough calculation of the answer to any reactance or resonance problem. This not only saves a lot of time but greatly reduces the chance for error as compared to finding the decimal point in the usual manner. For example, you can find that a 500-pf capacitor has a reactance of between 100 and 200 ohms at 2 mc in a matter of seconds with the DPL. This is accurate enough for many calculations, but when you need to be more precise, simply turn the rule over, set the frequency on the 2π scale and the capacitance on the C_x (which is the normal CI) scale and read 159 ohms on the C scale using the X_C (usual D) as index.

As another example, you can find from the DPL that the reactance of a 200- μ h choke is about 500 ohms at 455 kc. For greater precision, again turn the rule over, set the frequency 455 on the 2π scale, move the slide under the hairline to 200 on the L_x (CI) scale and read 573 ohms under the X_L (C) index on the D scale.

In both these problems we know nearly what the answer is by reading it



approximately on the DPL. This tells us that the answer to the first problem is not 15.9 ohms nor 1,590 ohms but 159, and that the answer to the last problem is not 57.3 nor 5,730 but 573 ohms. (Decimal points must normally be placed by using pencil and paper and rough calculations, with an ordinary slide rule.)

If, for example, you need to know what inductance would have 300 ohms reactance at 100 mc, just set the X_L indicator to 300, the hairline to 100 mc and read 0.5 μ h from the μ h scale, or you could find that a capacitance of 5 pf would have 300 ohms reactance at 100 mc, etc.

With the DPL you can make quick approximations of resonance. You could find, for example, that a 200-pf capacitor and a 500- μ h coil resonate near 500 kc. Reading from the front of the rule, on the H scale, shows that the actual frequency is 504 kc. Here again you can solve for any unknown; if you know frequency and capacitance, you can solve for L; if you know frequency and inductance, you can solve for C, or if you know frequency only, you can solve for the L-C product, etc.

In addition to the Decimal Point Locator on the reverse side of the rule, there are more than 60 of the most-used

electronics formulas and conversion factors—Ohm's law for dc circuits, Ohm's law for ac circuits, frequency and wavelength, reactance, resonance, decibels, power factor, transformer impedance ratios, parallel resistances, series and parallel impedances, coupled inductance, efficiency, temperature C to F and F to C and Kelvin, effective-to-average and effective-to-peak voltages, feet to meters, meters to miles, horsepower to watts, Q and many others.

The rule has all scales necessary for performing trigonometric functions and more than 30 pages of the instruction book are devoted to solving such problems. These examples are very helpful to users unfamiliar with slide rules.

The rule is all-aluminum, with adjustable slide tension, and comes in a handsome stitched leather case with a thick plastic insert to protect the rule. Every rule comes with a free four-lesson course that will be graded by instructors at CIE if you wish.

I introduced this rule to a group of high-school students studying electronics and struggling through various reactance and resonance problems. After a short course of instruction on the rule they really "came to life" and began solving all sorts of electronics problems for the sheer fun of it.—Wayne Lemons

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The Electronics Slide Rule and Special Slide Rule Course Were Developed by Cleveland Institute of Electronics

...one of the nation's largest and most widely respected home study schools of electronics



A slide rule is no better than the thinking behind it. That's why both the rule and the instructions on its use must be developed by experts.

And that's why this unique Electronics Slide Rule and 4-lesson course are winning such high praise in the electronics world.

For both the rule and the course were carefully developed as a special service by one of the most widely respected educational institutions in the electronics field—The Cleveland Institute of Electronics.

CIE was founded in 1934, to meet the widespread need of the time for home training in the operation and maintenance of the hundreds of new radio stations.

As Electronics has vastly increased in scope and importance, so have CIE Career courses.

Since 1950, over 50,000 students have enrolled. Today CIE is the only home study school in the nation that provides complete coverage of the fundamentals of electronics, including up-to-minute coverage of logical troubleshooting

... laser theory and application ... microminiaturization ... single sideband techniques ... pulse theory and application ... Boolean Algebra.

Other outstanding features of the Institute:

- **FCC LICENSE WARRANTY:** you get your FCC License or your money back. (Course descriptions below show which courses this covers.)

- **AUTO-PROGRAMMED™ LESSONS** make it possible for students to learn Electronics who have been "stymied" by the conventional textbook approach.

- **PERSONAL INSTRUCTION** by highly qualified instructors helps you over your own individual "rough spots."

- **EMPLOYMENT SERVICE** provides you with Job Opportunity Bulletins, free resumes and letters of recommendation, personal advice and encouragement.

For complete information on any CIE Career Course described below, simply return the coupon in the postpaid envelope provided.

The Career Courses offered by CIE

1. ELECTRONICS TECHNOLOGY—66 lessons

A comprehensive program in electronics theory and mathematics covering Automation, Communications, Computers, Industrial Controls, Television, Transistors, Troubleshooting and preparation for 1st Class FCC License.

2. INDUSTRIAL ELECTRONICS & AUTOMATION—51 lessons

This program emphasizes Industrial Electronics and Automation including such important subjects as Computers, Electronic Heating and Welding, Industrial Controls, Industrial Television, Servomechanisms and Solid State Devices.

3. BROADCAST ENGINEERING—64 lessons

An excellent program in studio engineering covering Transcription and Reproduction Equipment, Program Transmission, Broadcast Transmitters and 1st Class FCC License preparation.

4. FIRST-CLASS FCC LICENSE—36 lessons

A streamlined program in preparation for a 1st Class FCC License enabling you to operate and maintain aviation, broadcasting, marine, microwave, or mobile transmitting equipment.

5. ELECTRONIC COMMUNICATIONS—39 lessons

A specialized course in communications leading to a 2nd Class FCC License with Microwave, Mobile Radio, Frequency Modulation, Transistors and Troubleshooting.

6. ADVANCED COMMUNICATIONS ENGINEERING—75 lessons

A college-level engineering program on Communication Mathematics; AC and DC Theory; Communication Networks; Bilateral Circuits and Network Analysis; Magnetic Circuit and Radiation Propagation Phenomena; and Radio Components and Systems.

(DETACH HERE)

If you would like to receive,
without cost or obligation, a free
catalog of CIE's Career Courses,
"How To Succeed in Electronics"



... fill out this coupon and mail in
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CLEVELAND INSTITUTE OF ELECTRONICS, 1776 East 17th St., Cleveland, Ohio 44114

Please send me without cost or obligation your 40-page catalog... "How To Succeed In Electronics"... describing the job opportunities in Electronics today, how your courses can prepare me for them, your methods of instruction, and your special student services. I am especially interested in:

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Accredited Member National Home Study Council. A leader in Electronics Training... Since 1934.

Cleveland Institute of Electronics

1776 East 17th Street • Cleveland, Ohio 44114



C



This scale model is smaller than actual size. The rule is full 12 1/2" long by 2" wide.

Just lift off cardboard replica to see special electronics scales on both sides.

Finally, a slide rule made-to-order for

people in electronics (and a complete 4-lesson
instruction course to go with it)

It's yours to try at home or work for 10 days

Dear Friend:

The little cardboard model of a slide rule affixed to this letter represents no ordinary "slip stick." Pick it up...turn it over...look at the calibrations as well as the handy quick-reference formulas. You'll see what I mean.

This is the only slide rule of its type made especially for people in electronics. And we're the only ones who have it. It will enable you to make electronic computations and solve electronic problems more quickly and easily than you ever expected.

The four problems on the outside of the envelope of this letter, for instance, would normally take five minutes or more to solve with pencil and paper. Yet the enclosed illustrated booklet shows how you could solve the same problems in just 67 seconds.

You can do this even if you're not especially fast at math, or have never before held a slide rule in your hands. We'll teach you how.

With the slide rule we present an easy-to-follow four-lesson programmed course in how to use it. This means that in just a few weeks you can begin solving complex problems quickly, correctly, and without fatigue. In fact, it is covered by our Satisfaction Warranty.

Just return the enclosed Certificate with your remittance. We'll rush you a brand-new CIE Electronics Slide Rule (in a handsome top-grain leather carrying case) and the complete AUTO-PROGRAMMED Course in how to use it. Then ... if you're not thrilled and impressed after your very first lesson, return everything in 10 days for a full refund.

Not only is this slide rule something special. So is the course.

In the electronics field, we've pioneered in the use of "Programmed Learning." This is the

(continued on other side...)

method of instruction which has proved so effective in teaching special skills to men in the military services. Each little part of every lesson is like a building block. It adds to the knowledge you just acquired. And it prepares you for the knowledge just ahead.

In teaching you to master the electronics slide rule, we combine Programmed Learning with our school's perfected system of personalized grading. As you reach the end of each lesson, you are given a special exam which you can return to your instructor for grading. If you get stuck or have any questions, your instructor is always waiting here to give you the personal help you need.

When you complete the course, you receive a handsome Graduation Certificate which many students frame and proudly display as evidence of their new skill.

What the Slide Rule and Course Can Mean to You

Once you master the use of this marvelous slide rule, you'll wonder how you ever got along without it. It will save you time and mistakes every day. Given a problem, you simply look up the right formula to use on one side of the rule. Then you make your calculations on the other. Your

answers are read directly. There's no need to convert from one unit to another. And you never have to practically re-work the entire problem in order to place your decimal point. The Decimal Point Locator does that for you, accurately, every time.

Think what the time you save can mean to you. Extra hours to start a special new project... or develop a better way of handling an old one. Time to think and study, to work your way toward a promotion or a raise in pay.

And think of the advantage you'll have over others around you! In the world's most progressive field, it's a crime to be still struggling along with pencil and paper -- a calculating method more primitive than the ancient abacus. Yet a surprising number still do. You can now step out ahead of them.

Why Our Price Is So Low

The price for everything is not the \$40 or \$50 that people tell us we could easily get, but only \$19.95...postpaid. We deliberately keep the price cut to the bone. We're not so much interested in making money on slide rules as we are in spreading the news about the high quality of our instructional methods. Once you see the slide rule and sample one of the lessons, we think you'll agree that this is an excellent value.

Mail Card for No-Risk 10-Day Trial

But you be the judge of that. Just mail back the enclosed Certificate with payment in the post-

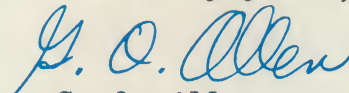
paid air mail envelope. We'll rush you the CIE slide rule in its handsome leather case and the complete 4-lesson course to examine at your leisure.

Look over the course and use the Slide Rule for ten full days. Actually try Lesson One. See for yourself how clear and helpful it is.

If, at the end of ten days, you feel you'd rather stick to the pencil and paper method of solving electronics problems, return everything and every penny of your money will be promptly and cheerfully refunded -- no questions asked.

Fair enough? You really have nothing to lose by returning the card. And many hours of saved time and effort to gain.

Sincerely yours,



G. O. Allen
President